

*IN THE UNITED STATES PATENT AND TRADEMARK OFFICE*

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In re Patent Application of:  
Hannu Mikkonen, *et al.*

Application No.: 10/528,993

Confirmation No.: 6390

Filing Date: January 11, 2006

Art Unit: 1623

For: POLYMER SOLUTION AND DISPERSION  
AND A PROCESS FOR THE PREPARATION  
THEREOF

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Examiner: KRISHNAN

**DECLARATION UNDER 37 CFR 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

1. I, Dr. Soili Hellevi Peltonen, declare as follows:
2. I graduated in 1969 with a Bachelors of Science from the University of Oulu, in Finland. I then obtained a Masters of Science from University of Oulu in 1971, specifically studying organic chemistry as well as mathematics and physics. In 1976 I obtained my doctorate (Lic.Phil.) in organic chemistry from the University of Oulu concentrating my studies on polyphenols of spruce and pine bark.
3. In the 1970s and early 1980s I was employed variously as: a part-time teacher at the University of Oulu, studying polyphenolic compounds of wood bark (fractionation,

characterisation and derivatization) as well as studying terpenes and oxetanes, a Research Associate at the University of Oulu; and a Research Associate at the Academy of Finland.

4. From 1981 through 1989 I was employed by Veitsiluoto Ltd., first as a Laboratory Manager and then as a Research Manager. My responsibilities involved Research and Development, Quality Control and Customer Service for Product Groups such as tall oil and turpentine distillates, adhesive tackifiers, binders for printing inks, polymerisation emulsifiers, rosin based paper sizes and SB-latices.

5. From 1989 until 1997 I was the Research and Development Manager at Primalco Ltd. I was primarily responsible for research and development of starch derivatives, starch based adhesives, tableting excipients, bioplastics, and water dispersions of bio-polymers, lactic acid polymers, and biomass fractionation.

6. From 1997 to present I have been the Team Leader, Customer Manager, and Research Coordinator for Valtion teknillinen tutkimuslaitos (VTT). From 1997 through 2006 I was responsible for research on biopolymers and natural polymers and was also the Manager of Rajamäki pilot hall. Further, I was responsible for research and preparation of conductive polymers in co-operation with a customer. From 2007 to present I have been Customer Manager in Chemistry and Environment and Research Coordinator in Sustainable Chemistry.

7. I am familiar with the history of U.S. Patent Application No. 10/528,993, of which I am one of the named inventors.

8. I am aware of the Examiner's rejection of claims 1-16 as being unpatentable over Haasmaa et al. in view of Yoshioka et al. and over Peltonen et al. In my considered opinion,

these prior art rejections are not justified. Therefore the following testing and discussion are provided.

9. The closest prior art is Yoshioka et al., which discloses internal plasticization of cellulose acetates with the aid of succinic acid anhydride and epoxy compounds. Comparative testing has been carried out with respect to the disclosure of Yoshioka et al. and Example 4 of the present application. More specifically, testing has been conducted to demonstrate how well succinic anhydride works during dispersing as compared to the alkenyl succinic anhydride of the present invention.

10. In a test procedure, octenyl succinic anhydride was replaced with succinic anhydride. First, 50 g hydroxypropyl starch acetate (C6LN100) was mixed together with 5 g Mowiol 50-88, 30 g water, 13 g succinic anhydride, and 17 g triethylcitrate. The temperature of the mixture was adjusted to 95 – 98 °C for three hours while stirring the mixture. Then 13 g water was added and the temperature was maintained at 75 – 95 °C. Thereafter, the composition thus produced was cooled to 50 – 60 °C and water was gradually added during about two hours in a total amount of 50 g.

11. No dispersion was formed by the foregoing procedure. The solid phase comprising the product and the aqueous phase were present separately from each other. The solid phase was a rubbery mass.

12. When the same test was carried out by the process of the present invention, (Example 4), a stable and homogeneous aqueous dispersion with small particles was produced.

13. The above results clearly demonstrate that succinic anhydride does not work as a plasticizing agent for, e.g., hydroxypropyl starch acetate.

14. Additionally, it should be noted that poor predictability is typical for plasticization. As known in the art, e.g. diethyl succinate plasticizes well but dibutyl succinate is a poor plasticizer. In Yoshioka et al., the plasticizing agent is not in the first place the succinic anhydride by the side chain formed by succinic anhydride and epoxy. Based on prior knowledge it could have been expected that alkenyl succinate – which is less polar than succinic anhydride – would be even inferior to that compounds as a plasticizer. The situation is, however, the contrary. Inner plasticization does not give any indication how a compound would potentially work as an external plasticizer.

15. It is apparent that the present invention is distinct from the references cited by the Examiner, which relate to technologies that are significantly different from that of the present invention.

16. The undersigned declares further that all statements made herein of her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S. Code 1001 and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

By: \_\_\_\_\_

Dr. Soili Hellevi Peltonen

Date: \_\_\_\_\_

Sept. 18, 2008